

## CLAIMS

### **What is claimed is:**

1. A method in a data processing system having a program with a plurality of threads having a plurality of states, the method comprising the steps of:

5 running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;

receiving user input indicating a selected one of the plurality of states;

receiving user input indicating a selected one of the plurality of threads;

10 determining a portion of the measuring period during which the selected thread is in the selected state;

determining, during the portion of the measuring period, whether another thread other than the selected thread is in another state other than the selected state; and

15 when it is determined that the other thread is in the other state, determining an amount of time that the other thread is in the other state.

2. The method of claim 1, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the other state.

20 3. The method of claim 1, further comprising the steps of:  
determining, during the portion of the measuring period, whether the other thread is in the selected state;

when it is determined that the other thread is in the selected state, determining a second amount of time that the other thread is in the selected state; and

25 calculating a percent of the portion of the measuring period that constitutes the second amount of time that the other thread is in the selected state.

4. A method in a data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of time intervals, the method comprising the steps of:

5 receiving user input indicating one of the plurality of states to anchor;  
receiving user input indicating a selected one of the plurality of threads;  
determining a portion of the measuring period during which the selected thread is in the anchored state;  
determining, during the portion of the measuring period, whether another thread  
10 other than the selected thread is in another state other than the anchored state; and  
when it is determined that the other thread is in the other state, determining an amount of time that the other thread is in the other state.

5. The method of claim 4, further comprising the step of calculating a  
15 percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the other state.

6. The method of claim 4, further comprising the steps of:  
determining, during the portion of the measuring period, whether the other thread  
is in the anchored state;  
20 when it is determined that the other thread is in the anchored state, determining a second amount of time that the other thread is in the anchored state; and  
calculating a percent of the portion of the measuring period that constitutes the second amount of time that the other thread is in the anchored state.

7. A method in a data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of time intervals, the method comprising the steps of:

5 receiving user input indicating a selected one of the plurality of states;  
receiving user input indicating a selected one of the plurality of threads; and  
determining a portion of the measuring period during which the selected thread is  
in the selected state.

8. The method of claim 7, further comprising the steps of:  
10 determining, during the portion of the measuring period, whether another thread  
other than the selected thread is in another state other than the selected  
state;  
when it is determined that the other thread is in the other state, determining an  
amount of time that the other thread is in the other state; and  
15 calculating a percent of the portion of the measuring period that constitutes the  
amount of time that the other thread is in the other state.

9. The method of claim 7, further comprising the steps of:  
determining, during the portion of the measuring period, whether another thread  
other than the selected thread is in the selected state;  
20 when it is determined that the other thread is in the selected state, determining an  
amount of time that the other thread is in the selected state; and  
calculating a percent of the portion of the measuring period that constitutes the  
amount of time that the other thread is in the selected state.

10. A method in a data processing system having a program with a plurality of states, wherein the program executes via a plurality of paths during a measuring period, the method comprising the steps of:

- receiving user input indicating a selected one of the plurality of states;
- 5 receiving user input indicating a selected one of the plurality of paths of execution; and
- determining a portion of the measuring period during which the selected path of execution is in the selected state.

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running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;

receiving user input indicating a selected one of the plurality of states;

receiving user input indicating a selected one of the plurality of threads;

determining a portion of the measuring period during which the selected thread is in the selected state;

determining, during the portion of the measuring period, whether another thread other than the selected thread is in the selected state; and

when it is determined that the other thread is in the selected state, determining an amount of time that the other thread is in the selected state.

12. The method of claim 11, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the selected state.



15. A method in a data processing system having a program with a plurality of threads having a plurality of states, the method comprising the steps of:

running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;

receiving user input indicating a selected one of the plurality of states;  
determining a portion of the measuring period during which any of the plurality of threads is in the selected state;

determining, during the portion of the measuring period, whether a selected one of the plurality of threads is in another state other than the selected state;  
and

when it is determined that the selected thread is in the other state, determining an amount of time that the selected thread is in the other state.

16. The method of claim 15, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the selected thread is in the other state.

17. The method of claim 15, further comprising the steps of:

determining, during the portion of the measuring period, whether the selected thread is in the selected state;

when it is determined that the selected thread is in the selected state, determining a second amount of time that the selected thread is in the selected state;  
and

calculating a percent of the portion of the measuring period that constitutes the second amount of time that the selected thread is in the selected state.













29. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, the method comprising the steps of:

5 running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;

receiving user input indicating a selected one of the plurality of states;

receiving user input indicating a selected one of the plurality of threads;

10 determining a portion of the measuring period during which the selected thread is in the selected state;

determining, during the portion of the measuring period, whether another thread other than the selected thread is in another state other than the selected state; and

15 when it is determined that the other thread is in the other state, determining an amount of time that the other thread is in the other state.

30. The computer-readable medium of claim 29, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the other state.

20 31. The computer-readable medium of claim 29, further comprising the steps of:

determining, during the portion of the measuring period, whether the other thread is in the selected state;

25 when it is determined that the other thread is in the selected state, determining a second amount of time that the other thread is in the selected state; and

calculating a percent of the portion of the measuring period that constitutes the second amount of time that the other thread is in the selected state.



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35. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of time intervals, the method comprising the steps of:

- receiving user input indicating a selected one of the plurality of states;
- receiving user input indicating a selected one of the plurality of threads; and
- determining a portion of the measuring period during which the selected thread is in the selected state.

36. The computer-readable medium of claim 35, further comprising the steps of:

- determining, during the portion of the measuring period, whether another thread other than the selected thread is in another state other than the selected state;
- when it is determined that the other thread is in the other state, determining an amount of time that the other thread is in the other state; and
- calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the other state.

37. The computer-readable medium of claim 35, further comprising the steps of:

- determining, during the portion of the measuring period, whether another thread other than the selected thread is in the selected state;
- when it is determined that the other thread is in the selected state, determining an amount of time that the other thread is in the selected state; and
- calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the selected state.

38. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of states, wherein the program executes via a plurality of paths during a measuring period, the method comprising the steps of:

5 receiving user input indicating a selected one of the plurality of states;  
receiving user input indicating a selected one of the plurality of paths of  
execution; and  
determining a portion of the measuring period during which the selected path of  
execution is in the selected state.



39. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, the method comprising the steps of:

- 5        running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;
- receiving user input indicating a selected one of the plurality of states;
- receiving user input indicating a selected one of the plurality of threads;
- 10        determining a portion of the measuring period during which the selected thread is in the selected state;
- determining, during the portion of the measuring period, whether another thread other than the selected thread is in the selected state; and
- 15        when it is determined that the other thread is in the selected state, determining an amount of time that the other thread is in the selected state.

40. The computer-readable medium of claim 39, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the other thread is in the selected state.

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41. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of  
5 time intervals, the method comprising the steps of:  
receiving user input indicating one of the plurality of states to anchor;  
receiving user input indicating a selected one of the plurality of threads;  
determining a portion of the measuring period during which the selected thread is  
in the anchored state;  
10 determining, during the portion of the measuring period, whether another thread  
other than the selected thread is in the anchored state; and  
when it is determined that the other thread is in the anchored state, determining  
an amount of time that the other thread is in the anchored state.

42. The computer-readable medium of claim 41, further comprising the step  
15 of calculating a percent of the portion of the measuring period that constitutes the  
amount of time that the other thread is in the anchored state.

43. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, the method comprising the steps of:

5        running the program and determining the state of each thread during a measuring period, wherein the measuring period comprises a plurality of time intervals;  
receiving user input indicating a selected one of the plurality of states;  
determining a portion of the measuring period during which any of the plurality  
10        of threads is in the selected state;  
determining, during the portion of the measuring period, whether a selected one of the plurality of threads is in another state other than the selected state;  
and  
when it is determined that the selected thread is in the other state, determining an  
15        amount of time that the selected thread is in the other state.

44. The computer-readable medium of claim 43, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the selected thread is in the other state.

45. The computer-readable medium of claim 43, further comprising the steps  
20    of:  
determining, during the portion of the measuring period, whether the selected thread is in the selected state;  
when it is determined that the selected thread is in the selected state, determining a second amount of time that the selected thread is in the selected state;  
25        and  
calculating a percent of the portion of the measuring period that constitutes the second amount of time that the selected thread is in the selected state.

46. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of  
5 time intervals, the method comprising the steps of:

receiving user input indicating one of the plurality of states to anchor;  
determining a portion of the measuring period during which any of the plurality  
of threads is in the anchored state;  
determining, during the portion of the measuring period, whether a selected one  
10 of the plurality of threads is in another state other than the anchored state;  
and  
when it is determined that the selected thread is in the other state, determining an  
amount of time that the selected thread is in the other state.

47. The computer-readable medium of claim 46, further comprising the step  
15 of calculating a percent of the portion of the measuring period that constitutes the  
amount of time that the selected thread is in the other state.

48. The computer-readable medium of claim 46, further comprising the steps  
of:  
determining, during the portion of the measuring period, whether the selected  
20 thread is in the anchored state;  
when it is determined that the selected thread is in the anchored state,  
determining a second amount of time that the selected thread is in the  
anchored state; and  
calculating a percent of the portion of the measuring period that constitutes the  
25 second amount of time that the selected thread is in the anchored state.

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49. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of  
5 time intervals, the method comprising the steps of:  
receiving user input indicating a selected one of the plurality of states; and  
determining a portion of the measuring period during which any of the plurality of threads is in the selected state.

50. The computer-readable medium of claim 49, further comprising the steps  
10 of:  
determining, during the portion of the measuring period, whether a selected one of the plurality of threads is in another state other than the selected state;  
when it is determined that the selected thread is in the other state, determining an amount of time that the selected thread is in the other state; and  
15 calculating a percent of the portion of the measuring period that constitutes the amount of time that the selected thread is in the other state.

51. The computer-readable medium of claim 49, further comprising the steps  
of:  
determining, during the portion of the measuring period, whether a selected one  
20 of the plurality of threads is in the selected state;  
when it is determined that the selected thread is in the selected state, determining an amount of time that the selected thread is in the selected state; and  
calculating a percent of the portion of the measuring period that constitutes the amount of time that the selected thread is in the selected state.

52. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of states, wherein the program executes via a plurality of paths during a measuring period, the method comprising the steps of:

- 5 receiving user input indicating a selected one of the plurality of states; and  
determining a portion of the measuring period during which any of the plurality  
of paths of execution is in the selected state.



55. A computer-readable medium containing instructions for controlling a data processing system to perform a method, the data processing system having a program with a plurality of threads having a plurality of states, wherein the program executes during a measuring period and the measuring period comprises a plurality of time intervals, the method comprising the steps of:

receiving user input indicating one of the plurality of states to anchor;  
determining a portion of the measuring period during which any of the plurality of threads is in the anchored state;  
determining, during the portion of the measuring period, whether a selected one of the plurality of threads is in the anchored state; and  
when it is determined that the selected thread is in the anchored state, determining an amount of time that the selected thread is in the anchored state.

56. The computer-readable medium of claim 55, further comprising the step of calculating a percent of the portion of the measuring period that constitutes the amount of time that the selected thread is in the anchored state.



57. A data processing system comprising:

a memory device further comprising

a target program with a plurality of threads having a plurality of states,  
wherein the target program executes during a measuring period  
and the measuring period comprises a plurality of time intervals;  
and

a monitoring program that receives user input indicating one of the  
plurality of states to anchor, that receives user input indicating a  
selected one of the plurality of threads, that determines a portion  
of the measuring period during which the selected thread is in the  
anchored state, that determines, during the portion of the  
measuring period, whether another thread other than the selected  
thread is in another state other than the anchored state, and when it  
is determined that the other thread is in the other state, the  
monitoring program determines an amount of time that the other  
thread is in the other state; and

a processor for running the target program and the monitoring program.

58. The data processing system of claim 57, wherein the monitoring program  
further calculates a percent of the portion of the measuring period that constitutes the  
amount of time that the other thread is in the other state.

59. The data processing system of claim 57, wherein the monitoring program  
further determines, during the portion of the measuring period, whether the other thread  
is in the anchored state, when it is determined that the other thread is in the anchored  
state, the monitoring program determines a second amount of time that the other thread is  
in the anchored state, and calculates a percent of the portion of the measuring period that  
constitutes the second amount of time that the other thread is in the anchored state.



63. A data processing system comprising:

a memory device further comprising:

a target program with a plurality of threads having a plurality of states,  
wherein the target program executes during a measuring period  
and the measuring period comprises a plurality of time intervals;  
and

a monitoring program that receives user input indicating one of the  
plurality of states to anchor, that receives user input indicating a  
selected one of the plurality of threads, that determines a portion  
of the measuring period during which the selected thread is in the  
anchored state, that determines, during the portion of the  
measuring period, whether another thread other than the selected  
thread is in the anchored state, and when it is determined that the  
other thread is in the anchored state, the monitoring program  
determines an amount of time that the other thread is in the  
anchored state; and

a processor for running the target program and the monitoring program.

64. The data processing system of claim 63, wherein the monitoring program  
further calculates a percent of the portion of the measuring period that constitutes the  
amount of time that the other thread is in the anchored state.

65. A data processing system comprising:

a memory device further comprising:

a target program with a plurality of threads having a plurality of states,  
wherein the target program executes during a measuring period  
and the measuring period comprises a plurality of time intervals;  
and

a monitoring program that receives user input indicating one of the  
plurality of states to anchor, that determines a portion of the  
measuring period during which any of the plurality of threads is in  
the anchored state, that determines, during the portion of the  
measuring period, whether a selected one of the plurality of  
threads is in another state other than the anchored state, and when  
it is determined that the selected thread is in the other state, the  
monitoring program determines an amount of time that the  
selected thread is in the other state; and

a processor for running the target program and the monitoring program.

66. The data processing system of claim 65, wherein the monitoring program  
further calculates a percent of the portion of the measuring period that constitutes the  
amount of time that the selected thread is in the other state.

67. The data processing system of claim 65, wherein the monitoring program  
further the monitoring program determines, during the portion of the measuring period,  
whether the selected thread is in the anchored state, when it is determined that the  
selected thread is in the anchored state, the monitoring program determines a second  
amount of time that the selected thread is in the anchored state, and calculates a percent  
of the portion of the measuring period that constitutes the second amount of time that the  
selected thread is in the anchored state.

68. A data processing system comprising:

a memory device further comprising:

a target program with a plurality of threads having a plurality of states,  
wherein the target program executes during a measuring period  
and the measuring period comprises a plurality of time intervals;  
and

a monitoring program that receives user input indicating a selected one of  
the plurality of states, and that determines a portion of the  
measuring period during which any of the plurality of threads is in  
the selected state; and

a processor for running the target program and the monitoring program.

69. The data processing system of claim 68, wherein the monitoring program  
further determines, during the portion of the measuring period, whether a selected one of  
the plurality of threads is in another state other than the selected state, when it is  
determined that the selected thread is in the other state, the monitoring program  
determines an amount of time that the selected thread is in the other state, and calculates  
a percent of the portion of the measuring period that constitutes the amount of time that  
the selected thread is in the other state.

70. The data processing system of claim 68, wherein the monitoring program  
further determines, during the portion of the measuring period, whether a selected one of  
the plurality of threads is in the selected state, when it is determined that the selected  
thread is in the selected state, the monitoring program determines an amount of time that  
the selected thread is in the selected state, and calculates a percent of the portion of the  
measuring period that constitutes the amount of time that the selected thread is in the  
selected state.

71. A data processing system comprising:

a memory device further comprising:

a target program with a plurality of threads having a plurality of states,  
wherein the target program executes during a measuring period  
and the measuring period comprises a plurality of time intervals;  
and

a monitoring program that receives user input indicating one of the  
plurality of states to anchor, that determines a portion of the  
measuring period during which any of the plurality of threads is in  
the anchored state, that determines, during the portion of the  
measuring period, whether a selected one of the plurality of  
threads is in the anchored state, and when it is determined that the  
selected thread is in the anchored state, the monitoring program  
determines an amount of time that the selected thread is in the  
anchored state; and

a processor for running the target program and the monitoring program.

72. The data processing system of claim 71, wherein the monitoring program  
further calculates a percent of the portion of the measuring period that constitutes the  
amount of time that the selected thread is in the anchored state.

73. A system having a program with a plurality of states, wherein the program executes via a plurality of paths during a measuring period, the system comprising:  
means for receiving user input indicating a selected one of the plurality of states;  
means for receiving user input indicating a selected one of the plurality of paths  
of execution; and  
means for determining a portion of the measuring period during which the  
selected path of execution is in the selected state.

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